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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CALANDRA, ANTHONY J

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1791

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/564,373	Applicant(s) MARTIKAINEN ET AL.	
	Examiner ANTHONY J. CALANDRA	Art Unit 4128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☒ Claim(s) 1 and 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/12/06 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/12/06</u> . | 6) <input type="checkbox"/> Other: _____ |

Detailed Office Action

1. The communication dated 1/12/2006 has been entered and fully considered.
2. Claims 1-11 are currently pending.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the single combined hot black liquor accumulator of claim 8 must be shown or the feature(s) canceled from the claim(s). Both drawings supplied show two hot black liquor accumulators. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 1 and 4 are objected to because of the following informalities:

Claim 1 for the typographical error 'admixed' should be 'and mixed'.

Claim 4 uses a comma instead of a decimal point.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 6, and 7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by *Effect of Pretreatment with Green Liquor, AQ and Polysulfide on the Performance of an Extended Batch System* by WIZANI et al., hereinafter WIZANI et al. as evidenced by *A combined discrete-continuous simulation model of an RDH tank farm* by SEZGI et al., hereinafter SEZGI et al.

As for claim 1, WIZANI et al. discloses a process for using polysulfide liquor during the pretreatment step of an extended batch delignification process, RDH, which was found to improve the yield (*A batch process for the preparation of kraft pulp with improved Yield from lignin-containing cellulosic material, comprising the steps of*[see e.g. abstract]). WIZANI et al states that the polysulfide can be added to either the WBL or HBL stage of the RDH process and found the highest yield increase was found when adding the polysulfide to the WBL stage (*filling and pressurizing said vessel with impregnation liquor collected from a previous batch, said*

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impregnation liquor admixed with, or preceded by an addition of a volume of polysulfide white liquor [see e.g. pg. 422]). The WBL stage of the RDH process is the impregnation stage of the cook (*impregnating the cellulosic material with the resulting mixture of impregnation liquor*). WIZANI et al. describes that there is a HBL, hot black liquor, and a cooking liquor stage [see e.g. pg. 422]. WIZANI et al. discloses that it is an RDH process. The RDH process has the remaining instant claimed steps as is further evidenced by SEZGI et al. SEZGI et al. discloses that the RDH process has a hot black liquor fill (*Displacing the impregnation liquor with hot spent cooking liquor and reacting the impregnated cellulosic material with said hot spent liquor* [see e.g. pg 213 and Figure 1]. SEIZGI et al. further disclose that the RDH process displaces the hot black liquor with white liquor and cooks the pulp to the proper time at temperature (*displacing hot spent cooking liquor with a volume of hot white liquor and cooking the cellulosic material with said white liquor to a desired degree of delignification* [see e.g. pg. 213 and Figure 1]. SEIZGI et al. finally discloses that an RDH process has a displacement step (*displacing the liquor used for cooking* [see e.g. pg. 213 and Figure 1]).

As for claim 4, WIZANI et al. disclose the use of 1.6% polysulfide charge on wood was used [see e.g. pg 422], which falls within the instant claimed range.

As for claim 6 and 7, WIZANI et al. discloses that the cooking catalyst, anthroquinone, can be added to either the WBL, HBL, or white liquor cooking stage of the RDH process [see e.g. pg 422].

As for claim 8, WIZANI et al. discloses that the batch process is an RDH process [see e.g. abstract]. The RDH has a *single* HBL tank where hot black liquor is displaced to by the hot

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white liquor fill [see e.g. Figure 1]. Then during the displacement step the hot displaced liquor is also sent to the HBL tank while the cooler displaced liquid is sent to the WBL tank.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Effect of Pretreatment with Green Liquor, AQ and Polysulfide on the Performance of an Extended Batch System* by WIZANI et al., hereinafter WIZANI et al. as evidenced by *A combined discrete-continuous simulation model of an RDH tank farm* by SEZGI et al., hereinafter SEZGI et al.

As for claim 5, WIZANI et al. discloses that the polysulfide liquor is added with the impregnation WBL [see e.g. pg 422]. WIZANI et al. does not disclose that the polysulfide liquor should be added before the WBL impregnation treatment. At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the polysulfide liquor before the impregnation liquor. The selection of the ordering of the mixture of ingredients in the absence of

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unexpected results is prima facie obvious [see e.g. MPEP 2144.04 (IV) (C)]. Additionally, WIZANI et al. states that polysulfide degrades in high temperatures thus a person of ordinary skill in the art would be motivated to charge the polysulfide before the impregnation liquor if the impregnation liquor was hot enough to degrade the polysulfide [see e.g. pg 422].

As for claim 10, WIZANI et al. discloses that alkali must be effectively balanced to have the best performance from a Kraft cook [see e.g. pg. 419]. The WBL liquor of WIZANI is composed of the cooler displacement liquor that was not sent to the HBL tank as evidenced by SEZGI et al. [see e.g. Figures 1 and 2]. Therefore depending on the split of the amount of displacement liquor to the HBL or WBL tank, some liquor meant for the WBL tank could be sent to the HBL tank. A person of ordinary skill in the art would be motivated to send more of the WBL liquor to the HBL tank to adjust the concentration of hydroxide and sulfide remaining in the HBL liquor as to better optimize alkali concentration as taught by WIZANI et al [see e.g. pg. 419]

6. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Effect of Pretreatment with Green Liquor, AQ and Polysulfide on the Performance of an Extended Batch System* by WIZANI et al., hereinafter WIZANI et al. as evidenced by *A combined discrete-continuous simulation model of an RDH tank farm* by SEZGI et al., hereinafter SEZGI et al. in view of WIPO Publication 99/14423 STIGSSON et al., hereinafter STIGSSON et al.

As for claims 2 and 3, WIZANI et al. discloses that 1.6% polysulfide liquor was added *in addition to* the 21% active alkali, which was split 3% to the WBL, 3% to the HBL, and 15% to the W.L. cooking stage [see e.g. pg. 422]. WIZANI et al. does not disclose the active alkali content of the polysulfide liquor added to the WBL impregnation stage and therefore does not disclose

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the split of active alkali split between the impregnation and active alkali of the polysulfide liquor and total active alkali. STIGSSON et al. discloses a process for using polysulfide liquor during the impregnation before cooking to form pulp [see e.g. abstract]. STIGGSON et al. discloses that the proper split of polysulfide effective alkali to be about 60% or less effective alkali to the impregnation stage which overlaps with the instant claimed ranges [see e.g. pg. 6]. The split of effective alkali is equivalent to the split of active alkali at the same sulfidity of liquors. At the time of the invention it would have been obvious to use the polysulfide split of STIGGSON et al. in the batch process of WIZANI et al. A person of ordinary skill in the art would have been motivated to improve the process of WIZANI et al. by splitting the alkali charge in the manner taught by STIGGSON et al. as this condition was found suitable for stabilizing undesirable peeling reactions [see e.g. pg. 11]

Examiner notes that effective alkali is equal to $\text{NaOH} + 1/2 \text{Na}_2\text{S}$ while active alkali is $\text{NaOH} + \text{Na}_2\text{S}$. Depending on the method of generating the polysulfide liquor, there may be more or less Na_2S thus slightly affecting the percentage active alkali versus effective alkali percentage in the polysulfide white liquor added (instead of being equivalent). However, it would be obvious to further optimize the alkali split of STIGSSON et al. as sodium hydroxide and sodium sulfide profiling are highly influential on pulp yield and splitting the active alkali charges in different manners are well known in the art [see e.g. WIZANI *Introduction* pg. 419].

7. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Effect of Pretreatment with Green Liquor, AQ and Polysulfide on the Performance of an Extended Batch System* by WIZANI et al., hereinafter WIZANI et al. as evidenced by *A combined discrete-*

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continuous simulation model of an RDH tank farm by SEZGI et al., hereinafter SEZGI et al. in view of WIPO Publication WO 01/25531 PAAKI et al.

As for claim 9, WIZANI et al. teaches pulping wood utilizing a pretreatment of polysulfide during the batch RDH process [see e.g. abstract]. WIZANI et al. does not disclose using impregnation liquor for the first volume of the displacement step. PAAKI et al. discloses using impregnation liquor for the first step of displacement [see e.g. abstract and figure 1]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use impregnation liquor for the first part of displacement in the RDH process of WIZANI et al. A person of ordinary skill in the art would be clearly motivated to do this as the impregnation liquor contains calcium and by heating it in the digester by early displacement calcium carbonate will form in the digester and not on the evaporator surface [see e.g. abstract].

As for claim 11, WIZANI et al. teaches a WBL tank and a HBL tank. The HBL tank is the tank that houses the spent liquor. WIZANI et al. does not teach a second HBL tank. PAAKI et al. discloses a batch process with two hot black liquor tanks (1) and (2) [see e.g. Figure 1]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use a second black liquor tank of PAAKI et al. in the cooking process of WIZANI et al. A person of ordinary skill in the art would be motivated to do so to segregate liquors with different calcium profiles as spent liquor would only be sent to the second tank when there is low calcium levels [see e.g. pg. 10 lines 5 -15].

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is

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(571)270-5124. The examiner can normally be reached on Monday through Friday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on (571) 272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven P. Griffin/
Supervisory Patent Examiner, Art Unit
1791

AJC